

SIMON FRASER UNIVERSITY
Department of Economics

Econ 809
Advanced Macroeconomic Theory

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Spring 2004

FINAL EXAM - April 8

Answer the following questions True, False, or Uncertain. Briefly explain your answers. No credit without explanation. (5 points each).

1. The Friedman Rule is not optimal with distortionary taxes.
2. With idiosyncratic labor income risk and an infinite horizon, the risk-free rate must be less than the rate of time preference.
3. A one-time open-market purchase increases the price level.
4. In Aiyagari's (QJE, 1994) model, a tighter borrowing constraint raises the equilibrium interest rate.
5. Incomplete markets invalidate the predictions of representative agent models.
6. In the Lucas (EJ, 1992) model, trade in one-period non-state contingent bonds can support an information-constrained Pareto optimal risk-sharing allocation.

The following questions are short answer. Be sure to explain and interpret your answer.

7. (10 points). Critically evaluate the following statement by Milton Friedman: "Inflation is always and everywhere a monetary phenomenon".
8. (20 points). Consider an economy with two possible states, each of which occurs with probability $1/2$. In the good state, each individual's consumption is 1. In the bad state state, fraction λ of the population consumes $1 - (\phi/\lambda)$ and the remainder consumes 1, where $0 < \phi < 1$ and $\phi \leq \lambda \leq 1$. Note, ϕ measures the reduction in average consumption in the bad state, and λ measures how broadly that reduction is shared.
Now consider two assets, one that pays off 1 unit in the good state and one that pays off 1 unit in the bad state. Let p denote the relative price of the bad-state asset.
(a) Consider an individual whose initial holdings of the two assets are zero, and consider the experiment of the individual marginally reducing (ie, selling short) his or her holdings of the good-state asset and using the proceeds to buy more of the bad-state asset. Derive the condition for this perturbation not to affect the individual's expected utility.

- (b) Since consumption in the two states is exogenous and individuals are ex ante (but not ex post) identical, p must adjust to the point where it is an equilibrium for everyone's holdings of both assets to be zero. Solve the condition derived in part (a) for this equilibrium value of p . [Hint: The answer should be in terms of ϕ , λ , $U'(1)$, and $U'(1 - (\phi/\lambda))$].
- (c) Calculate $\partial p/\partial \lambda$, and show that if utility is quadratic then, $\partial p/\partial \lambda = 0$.
- (d) Show that if $U'''(\cdot)$ is everywhere positive then $\partial p/\partial \lambda < 0$. Interpret this result intuitively, and relate it to the analysis in Constantinides and Duffie (JPE, 1996).
9. (20 points). At each date $t \geq 0$, two political parties divide a “pie” of fixed size 1. Party 1 receives a sequence of shares $y = \{y_t\}$ and has utility function $E \sum_{t=0}^{\infty} \beta^t U(y_t)$, where U has the standard properties. Party 2 then receives share $1 - y_t$, and has utility function $E \sum_{t=0}^{\infty} \beta^t U(1 - y_t)$. A state variable X_t is governed by a Markov chain with S states. Assume there is a partition (S_1, S_2) of this state space such that if $X_t \in S_1$, party 1 chooses the division, $(y_t, 1 - y_t)$, while if $X_t \in S_2$ then party 2 chooses the division. At each point in time, both parties have the option of choosing “autarky”, in which case its share is 1 when it is in power, and zero when it is not in power. Formulate the history-dependent sharing rule as a dynamic contract. (*Hint*: Formulate a Bellman equation for party 1, letting $V[u_0(x), x]$ be the optimal value for party 1 in state x when party 2 is promised value $u_0(x)$. What are the promise-keeping and incentive constraints?).
10. (20 points). Several countries have recently considered the possibility of giving up their currencies in favor of the U.S. dollar. Suppose one of these countries has a real (gross of interest) deficit of $d = g - \tau + (B/R)(R - 1)$, where the real interest rate is fixed at $R = \beta^{-1}$. Assume the country is in a stationary equilibrium with constant inflation rate $\pi = 1/R_m$, where R_m is the return to holding money. Let the demand for money be $m_{t+1}/p_t = F(c_t, R_m/R)$, where F is increasing in both its arguments, and c_t is constant at $y - g$. Hence, the government budget constraint is

$$d = F(y - g, \beta R_m)(1 - R_m)$$

Assume that the country is considering, at $t = 0$, the retirement of its money in exchange for dollars. The government (credibly) promises to give each person e dollars per peso, where e is the exchange rate (in dollars per peso). Assume that the U.S. inflation rate (before and after the switch) is constant and equal to $\pi^* = 1/R_m^* < \pi$. Also assume that the country is on the “good” side of its Laffer curve.

- (a) The U.S. will gain some seignorage revenue. How much should the country request from the U.S. government to make the switch? Why? (Hint: Assume the U.S. will not agree to anything that makes itself worse off).
- (b) The government recognizes that once the switch takes place it will need to raise taxes. By how much? (Hints: How does your answer depend on whether the U.S. agrees to the request in part (a)? How does your answer depend on the country's initial holdings of dollar denominated assets?)